

Course description

Whether we are talking about climate change, health or the economy, science is increasingly seen as a source of advice and evidence for policymakers throughout government. But what is the relationship between science and decision-making? Where does evidence come from and who are the experts? How are ideas converted into law, treaty and regulation and how are they implemented in within governments? These are some of the questions we consider this course. Drawing on real-life case studies, as well as the academic literature from STS and political science, we will look at how science is used in government, in parliament, at a local and international level, taking account of the many actors and processes that shape this work

Basic course information

Moodle Web site:	HPSC0124
Assessment:	Assessment: Coursework 1 (1200 words) – 30%; Coursework 2 (2500 words) – 70%.
Timetable:	www.ucl.ac.uk/sts/hpsc
Prerequisites:	No pre-requisites
Required texts:	No required texts. Each week there are two or three essential readings
Course tutor(s):	Melanie Smallman
Contact:	m.smallman@ucl.ac.uk
Web:	www.ucl.ac.uk/sts/staff/smallman
Office location:	22 Gordon Square, Room 1.3
Office hours:	Monday 12.00-13.00 Wednesday 11.00-12.00

Schedule

UCL	Topic	Date	Activity
20	Introduction and Overview	13 Jan	Do the essential reading before each class to prepare for group presentations in class
21	Science in UK Government and Parliament	20 Jan	Do the essential reading before class
22	How Science is used in policymaking – Role of Chief Scientific Advisers and the Challenge of Evidence Based policymaking	27 Jan	Do the essential reading before class
23	Sources of evidence and types of expertise	03 February	Do the essential reading before each class
24	Visit to Select Committee/Palace of Westminster (TBC)	10 February	Check Moodle for details of meeting point etc. Assignment 1 due
25	Reading Week	17 February	No class
26	Science Advice at an International and Global Scale (guest lecturer TBC)	24 February	Do the essential reading before class
27	Lay expertise	2 March	Do the essential reading before class
28	Dealing with uncertainty in policy: Precautionary Principle and post-normal science Essay preparation and criteria	9 March	Do the essential reading before class

29	Politics and values in science and policymaking – why might different perspectives arise?	16 March	Do the essential reading before class
30	Challenges and Future perspectives	23 March	Assignment 2 Due

Aims

This module **aims**:

- To build clear understanding of the role and structure of democratic governments, in particular the difference between elected policymakers and officials and between the executive and scrutiny roles
- To build fundamental understanding of the relationship between scientific evidence and policymaking within government
- To introduce students to questions about expertise, sources of advice and how evidence is sourced and used within UK government, including Parliament, government ministries, and NGOs
- To integrate academic theory about science advice and policy with practical experience in policy-making and policy-implementing communities.

Objectives

By the end of this module, students should be able to:

- Demonstrate knowledge of the structure and roles of governments, devolved administrations, parliament, politicians and officials within the UK
- Demonstrate knowledge of processes shaping policy implementation in the UK, such as the role of Civil servants, politicians, Peers, local government and NGOs
- Demonstrate knowledge of essential literature on public policymaking, particularly in relation to evidence, expertise and science advice
- Discuss why evidence based policymaking is challenging and how science can be interpreted differently in different contexts.

Assessments

Coursework 1 (30%)	Policy analysis	1200 words	Assignment 1 due 17.00, 10 February 2019
Coursework 2 (70%)	Reflective Essay	2500 words	Assignment 2 due 17.00, 3 April 2019

Coursework 1: Policy Analysis

Choosing one of the topics below, take on the role of a civil servant and write an analysis for your Minister to advise them on the availability or otherwise of the evidence needed to act.

This analysis should include details of:

- The key issues for policymakers
- Brief Background to the case
- Aspects where evidence is needed
- The nature of the evidence available
- Whether/how it can be sourced
- Recommendations

Issue 1

The UK Parliament has recently declared a climate emergency. Environmental groups are asking for a commitment to reduce carbon emissions to zero by 2030. What do you recommend?

Issue 2

The UK Government has committed to making the UK a world leader in self-driving cars. An autonomous vehicle company would now like to test their cars for the first time on public roads in the UK. What do you recommend?

Issue 3

An incident in a nuclear reactor in Japan has resulted in radioactive material being released into the environment. Should the government advise all British Nationals living in a nearby city to evacuate?

Issue 4

Bovine TB has struck record levels in the Prime Minister's constituency and she wants your Department to take some sort of demonstrable action/make an announcement this summer. What do you recommend?

Coursework 2: Reflective Essay

In this assignment you should take a case study and use the concepts and lessons covered in the course to critically reflect on how and the question:

Why is scientific evidence important in policy and does it help make better policy?

In choosing the case study, you could take the topic you have already written about in your second assignment or a topic we have discussed in class. You are also welcome to choose your own case study, but please discuss it with the course tutor first.

Written work should be handed in via moodle (moodle.ucl.ac.uk). Do not e-mail coursework to the course tutor without prior permission.

Criteria for assessment

The departmental marking guidelines for individual items of assessment can be found in the STS Student Handbook.

Above these criteria, all the assessments will also be marked for the accessibility and clarity of their writing.

Coursework 1: Policy Analysis

Policy Analysis documents should be:

- Relevant to the topic
- Be thorough and accurate
- Written in good, clear English, with no spelling or grammatical errors and accessible to a non-technical audience
- Provide context
- Give clear recommendations
- Remain politically neutral

Coursework 2: Reflective Essay

In addition to the criteria indicated in the STS Student Handbook, the following are the main criteria on which your essay will be marked. There are no set numbers/ percentages associated with these criteria but we will give you qualitative feedback based on them.

1. Answer the question

Read the question carefully and answer it specifically – do not give irrelevant material or drift into answering other questions.

2. Organisation

Is the essay organized into an introduction, main body and conclusion? Does each part flow naturally into the next one? Is the evidence in a logical order? Using signposting sentences (in this section I will argue that...) will help.

3. Introduction

You should give an introduction to your essay in no more than one or two paragraphs. Introduce your topic and your line of argument, no more. Good introductions are concise and precise.

4. Clarity

We place great emphasis on clarity of argument and expression. Avoid ambiguity and vagueness. Do not assume your reader already knows what you are talking about. Try to keep your line of argument clear. It often helps clarity to divide the main body of the essay into sections (typically three or four for a 2500 word essay). Good use of English, accurate spelling, grammar, punctuation and simple, active sentence structure also improve clarity.

5. Argumentation

Is the main argument of the essay clear, coherent and persuasive? Is it properly supported by the evidence available?

6. Conclusion

Your essay should have a conclusion that is clearly marked as such (new paragraph, 'In conclusion...'). It should be substantial in summing up what you have argued and exploring the implications of what you have argued.

7. Reading/ use of sources

How well have the readings and other resources been used? Does the essay reflect them accurately? Is the essay overly dependent on one source?

8. Independent critique?

Does the essay offer some independent critique or thought on the question or does it merely report what is in the literature? In Masters-level courses this is an essential component of essays.

9. Referencing

You must reference all quotes and all references/ summaries of books, etc. Pick one system for referencing and stick to it. Refer to individual page numbers, not just whole texts, whenever possible. Making use of ideas from or paraphrasing material without clearly referencing the original source is plagiarism and has incurred serious penalties.

10. Bibliography

You need to supply a bibliography of all works referenced at the end of your essay. You must supply author, title, date, place of publication and publisher.

Format of classes

Classes will take a range of formats. Typically they will include an introductory 'lecture' by the course tutor (or guest lecturer where appropriate), followed by a class discussion.

Students will be asked to sign up to lead and participate in discussions, so please be prepared to speak and share your work in progress. Throughout we will draw on material from the reading list, so please come having read the material for each week.

One class will take place outside UCL, in the Palace of Westminster (subject to confirmation).

Reading list

Below is a list of **essential** and **advanced** readings for this module.

In class we will discuss at least the **essential** readings. If you haven't read them in advance, then you will gain the gist of the material during the lecture, although be aware that this level of understanding is insufficient to achieve good marks in this module. If you have read the papers in advance however, the lecture will help you make the cross connections, comparisons and critiques that you will need in order to do more than pass this module. The choice is yours!

If you have time, you should also read the **advanced** pieces to gain the highest marks in your assessments. It is also expected that you will explore additional material to inform your policy analysis, essays and class discussions.

Additional readings, referred to in lectures and to inform discussion, blog posts and essays, will be put on Moodle nearer the time.

Week 1: Introduction and Overview – Why is science used in government?

Introductory session, giving an overview of the key ideas within this course. In particular, we will look at the motivations and challenges behind using science in government and parliament. In this class, students will be asked to discuss the week's readings in small groups and to present key findings back to the class, so please come prepared to speak about the reading material.

Essential reading

Guidance to help your reading: This week we will be discussing why science is used in government. Below are speeches from politicians throughout history, on science and technology. While reading them, pay attention to why they seem to think science is important enough to give a speech on the topic and what they see as the main roles and purposes of science. Maybe write your thoughts down so you are ready to discuss them in class.

Harold Wilson 'Labour's Plan' 1963

<http://nottspolitics.org/wp-content/uploads/2013/06/Labours-Plan-for-science.pdf>

Margaret Thatcher's Speech to the Royal Society, 1988

<https://www.margaretthatcher.org/document/107346>

Tony Blair's speech on British Science 23 May 2002

<https://www.theguardian.com/politics/2002/may/23/speeches.tonyblair>

President Obama's Comments to Whitehouse Science Fair, 2016

<https://obamawhitehouse.archives.gov/the-press-office/2016/04/13/remarks-president-white-house-science-fair>

Vladimir Lenin, Report on the Work of the Council of People's Commissars. December 22, 1920

<http://soviethistory.msu.edu/1921-2/electrification-campaign/communism-is-soviet-power-electrification-of-the-whole-country/>

Week 2: Science in UK Government and Parliament

What is policymaking, how does it work in the UK and where does science fit? In this lecture we will look at the structures that exist in government and parliament and consider the various roles of MPs, Ministers and Civil Servants.

The distinction between government as the executive and parliament as the legislature is introduced; some policymaking is in the hands of the government, but legislative change can only happen through parliament. Meanwhile, parliament also scrutinises the work of government and uses science evidence to do this. How might the uses of evidence – and the motivation for drawing on science – differ between government and parliament? Finally we will consider what structures exist in government and parliament for governing and making use of science.

Essential reading

Overview of the UK system of Government:

http://webarchive.nationalarchives.gov.uk/20121003074658/http://www.direct.gov.uk/en/GovernmentCitizensandRights/UKgovernment/Centralgovernmentandthemonarchy/DG_073438

Have a look at this short series of videos explaining the basics of what select committees are:

<http://www.parliament.uk/about/podcasts/theworkofparliament/select-committees-in-the-house-of-commons/introduction/>

Advanced reading

How policy is made in the UK:

<https://paulcainey.wordpress.com/2013/08/04/policy-and-policymaking-in-the-uk-chapter-1-draft-1/>

For an example of material provided by POST and the HoC Library to inform a parliamentary debate regarding legislative change in relation to mitochondrial donation see

<http://www.parliament.uk/business/news/2015/february/commons-debate-statutory-instrument-on-mitochondrial-donation/>

Week 3: Evidence based policymaking and Science Advice in UK Government

How is science used in policymaking and how is this governed and managed? In this session we will look at the concept of evidence-based policymaking and the advice and support that is given to ministers and civil servants in using science in their roles. In particular, we will look at the role of Chief Scientific advisers and consider a case study from UK policy to see how this works in practice.

Essential Reading

A rough guide to science advice

<https://www.theguardian.com/science/political-science/2014/aug/27/a-rough-guide-to-science-advice>

Sutcliffe S. Court J (2005) Evidence-Based Policymaking: What is it? How does it work? What relevance for developing countries? Overseas Development Institute

<https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/3683.pdf>

Government Office for Science (2015), *Chief Scientific Advisers and their officials: an introduction*

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/426307/15-2-chief-scientific-advisers-and-officials-introduction.pdf

Advanced Reading

Peter Gluckman. (2014). The art of science advice to government. *Nature*, 507, 164–165.

https://www.nature.com/polopoly_fs/1.14838!/menu/main/topColumns/topLeftColumn/pdf/507163a.pdf

Shaxson, L. Harrison, M. Morgan, M. (2009) Developing an evidence-based approach to environmental policy making: insights from Defra's Evidence & Innovation Strategy. SPRU Electronic Working Paper Number 181

https://www.researchgate.net/profile/Louise_Shaxson/publication/242478652_Developing_an_evidence-based_approach_to_environmental_policy_making_insights_from_Defra's_Evidence_Innovation_Strategy/links/56a744e608ae997e22bbce86.pdf

House of Lords Select Committee on Science and Technology (2012), *The role and functions of departmental Chief Scientific Advisors*, HL Paper 264

<https://publications.parliament.uk/pa/ld201012/ldselect/ldsctech/264/264.pdf>

(Have a look at the first two chapters for a general overview of CSAs, and skim read other parts for an example of a select committee discussing the state of play in 2012.)

Week 4: Visit to Houses of Parliament (TBC)

Details and practical arrangements will be shared on moodle and in week 3 lecture.

Week 5: Sources of evidence and types of expertise

What is evidence, what is expertise and how are they identified and sourced? In this session we will consider these questions by looking at the academic literature and a case study of the UK government's responses to Bovine Tuberculosis. This case study will also illustrate some of the limits and challenges of using science in national policymaking, including inconclusiveness of evidence, uncertainty, competing evidence, and variability in the quality and availability of evidence. Questions we will consider include: Is there a 'hierarchy' of different kinds of scientific evidence and advice? How should different kinds of evidence be weighted? Does the available science describe the problem (e.g. whether neonicotinoids affect bees, the way in which badgers pass on BTb) or does it test the proposed policy solution (e.g. how farmers will behave in response to a neonic ban, what the outcomes of badger cull trials are)?

In this session, we will also discuss preparations for the first assessment.

Essential reading

BTb: This 2017 HoC Library Briefing paper provides information specifically on badger culling <http://researchbriefings.files.parliament.uk/documents/SN06837/SN06837.pdf>

A House of Commons Library 'Debate Pack' from 2016 provides links to government strategies in relation to tackling BTb, news articles and other background information <http://researchbriefings.files.parliament.uk/documents/CDP-2016-0152/CDP-2016-0152.pdf>.

Advanced Reading

Cassidy, Angela. 2015. "'Big Science' in the Field: Experimenting with Badgers and Bovine TB, 1995–2015." *History and Philosophy of the Life Sciences* 37 (3). Springer International Publishing: 305–25. doi:10.1007/s40656-015-0072-z.
<https://link.springer.com/article/10.1007/s40656-015-0072-z>

Week 6: Science Advice at an international and global scale (guest speaker TBC)

Many of today's most significant science policy issues can need to be tackled on a global scale. These include environmental issues such as climate change and biodiversity. Others operate at

a supranational scale. In each of these cases, there are structures established for examining the science and coming to an agreement about how to present the evidence (e.g. the IPCC reports). What are the challenges arising from fusing science with international diplomacy? Is science something that all sides can agree on and use as a starting point for discussions, or is it inherently political? How does decision making at this level gain legitimacy? Case studies also serve to illustrate how cultural contexts, civic epistemologies and compromises are relevant to international agreements.

Essential reading

Miller C. Civic Epistemologies: Constituting Knowledge and Order in Political Communities. *Sociology Compass* 2008 vol: 2 (6) pp: 1896-1919

<http://onlinelibrary.wiley.com/doi/10.1111/j.1751-9020.2008.00175.x/abstract>

Montana, J. (2016). 'How IPBES Works: The Functions, Structures and Processes of the Intergovernmental Platform on Biodiversity and Ecosystem Services.' *C-EENRG Working Papers*, 2016(2): 1-23. Cambridge Centre for Environment, Energy and Natural Resource Governance, University of Cambridge.

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2778701

IPCC: a description of the processes by which IPCC reports are produced

http://www.ipcc.ch/organization/organization_procedures.shtml

Advanced Reading

Chapter 1 of Jasanoff, Sheila. 2005. *Designs on Nature: Science and Democracy in Europe and the United States*. Princeton University Press. <http://press.princeton.edu/titles/7958.html>.

<http://assets.press.princeton.edu/chapters/s7958.pdf>

Kleinman, D. L., and S. Suryanarayanan. 2012. "Dying Bees and the Social Production of Ignorance." *Science, Technology & Human Values*, May, 0162243912442575-. doi:10.1177/0162243912442575.

Montana, J. (2017). 'Accommodating consensus and diversity in environmental knowledge production: Achieving closure through typologies in IPBES.' *Environmental Science and Policy*. 68. 20-27. DOI: 10.1016/j.envsci.2016.11.011

<http://www.sciencedirect.com/science/article/pii/S146290111630555X>

Montana, J. and Borie, M. (2016; equal contribution). 'IPBES and biodiversity expertise: Regional, gender and disciplinary balance in the composition of the interim and 2015 Multidisciplinary Expert Panel.' *Conservation Letters*. 9(2): 138-142. DOI: 10.1111/conl.12192

<http://onlinelibrary.wiley.com/doi/10.1111/conl.12192/abstract>

Week 6: Lay Expertise – can the public ever be experts?

Can the public ever be experts? This session helps us move towards being more critical of the relationships between science and government by considering this question in the context of relevant literature. To do this, we look at five key papers. Students will be assigned to one of five groups and each group will take one of the papers below. While I would encourage you to read all of the papers, for next week's class, I want each of you to read the paper that has been assigned to your group. When you are reading, please think (and make notes) about:

- What the key message of the paper is
- Whether it tells us anything about the issues we have discussed so far on this module (you might need to think laterally not literally here)
- Why I have chosen it as a 'key' paper
- How you would explain the ideas in the paper to the rest of the class

In class, you will have 30mins in your groups to put together a presentation about the paper (describing it to the class and answering the questions above). Each group will then present their papers to the class, to prepare us for a discussion about the papers collectively.

Group 1

Epstein, S. (1995) 'The Construction of Lay Expertise: AIDS Activism and the Forging of Credibility in the Reform of Clinical Trials', *Science, Technology, & Human Values*. Sage Publications, Inc., pp. 408–437. doi: 10.2307/689868.
https://www.jstor.org/stable/689868?seq=1#page_scan_tab_contents

Group 2

Wynne, B. (1992) 'Misunderstood misunderstanding: social identities and public uptake of science', *Public Understanding of Science*, 1(3), pp. 281–304. doi: 10.1088/0963-6625/1/3/004.
<http://pus.sagepub.com/cgi/content/abstract/1/3/281>

Group 3

Suryanarayanan, S. and Kleinman, D. L. (2013) 'Be(e)coming experts: The controversy over insecticides in the honey bee colony collapse disorder', *Social Studies of Science*. SAGE Publications Sage UK: London, England, 43(2), pp. 215–240.
<https://journals.sagepub.com/doi/abs/10.1177/0306312712466186>

Group 4

Jasanoff, S. (2003) 'Technologies of Humility: Citizen Participation in Governing Science', *Minerva*. Springer Netherlands, pp. 223–244. doi: 10.1023/A:1025557512320.
<http://www.springerlink.com/content/qv3vj6548kn55h25/>

Group 5

Sarewitz, D. (2004) 'How science makes environmental controversies worse', *Environmental Science & Policy*. Elsevier, 7(5), pp. 385–403. doi: 10.1016/J.ENVSCI.2004.06.001.
<https://www.sciencedirect.com/science/article/pii/S1462901104000620>

Dealing with uncertainty in policy: Precautionary Principle and post-normal science

Week 7: Dealing with uncertainty in policy

Most policy issues that require scientific input take place against a backdrop of great uncertainty – often both scientific and social. In this session we will consider how uncertainty is handled in policymaking contexts.

Essential reading

Science for the post-normal age

Silvio O. Funtowicz, Jerome R. Ravetz, Science for the post-normal age. *Futures*, Volume 25, Issue 7, 1993, Pages 739-755,

<https://www.sciencedirect.com/science/article/abs/pii/001632879390022L>

Kriebel, D., Tickner, J., Epstein, P., Lemons, J., Levins, R., Loechler, E. L., ... Stoto, M. (2001). The precautionary principle in environmental science. *Environmental health perspectives*, 109(9), 871–876. doi:10.1289/ehp.01109871

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1240435/>

Advanced Reading

(from previous weeks)

Jasanoff, S. (2003) 'Technologies of Humility: Citizen Participation in Governing Science', *Minerva*. Springer Netherlands, pp. 223–244. doi: 10.1023/A:1025557512320.

<http://www.springerlink.com/content/qv3vj6548kn55h25/>

Sarewitz, D. (2004) 'How science makes environmental controversies worse', *Environmental Science & Policy*. Elsevier, 7(5), pp. 385–403. doi: 10.1016/J.ENVSCI.2004.06.001.

<https://www.sciencedirect.com/science/article/pii/S1462901104000620>

Cassidy, Angela. 2015. "'Big Science' in the Field: Experimenting with Badgers and Bovine TB, 1995–2015." *History and Philosophy of the Life Sciences* 37 (3). Springer International Publishing: 305–25. doi:10.1007/s40656-015-0072-z.

<https://link.springer.com/article/10.1007/s40656-015-0072-z>

Week 8: Politics and values in science and policymaking – why might different perspectives arise?

In the various case studies looked at to date, we have seen how policy based upon science nevertheless differs in its interpretation of science. Do policymakers wilfully ignore the science and twist it to suit their objectives, or is science less objective than we may believe? In this session we will consider these issues, to reflect on how values are expressed in science based policymaking and why different perspectives might arise.

Essential Reading

Smallman, M. “‘Nothing to Do with the Science’: How an Elite Sociotechnical Imaginary Cements Policy Resistance to Public Perspectives on Science and Technology through the Machinery of Government’. *Social Studies of Science*, 11 October 2019, 0306312719879768. <https://doi.org/10.1177/0306312719879768>.

Jasanoff, Sheila, and Hilton R Simmet. ‘No Funeral Bells: Public Reason in a “post-Truth” Age’’. *Social Studies of Science* 47, no. 5 (October 2017): 751–770. <https://doi.org/10.1177/0306312717731936>.

Week 9: Challenges and future perspectives

- Constitution of expertise
- Separation of science and politics
- Framing policy
- Gender issues
- Incorporating wider perspectives

Essential reading

Sarewitz D. How science makes environmental controversies worse. *Environmental Science & Policy*. Volume 7, Issue 5, October 2004, Pages 385-403
<http://www.sciencedirect.com/science/article/pii/S1462901104000620>

House of Commons Public Administration Select Committee 2013-2014: Public engagement in policy-making

<https://publications.parliament.uk/pa/cm201314/cmselect/cmpublicadm/75/75.pdf>

<http://www.sciencedirect.com/science/article/pii/S1462901104000620>

Advanced Reading

A. Irwin, “STS Perspectives on Scientific Governance,” in E. Hackett et al., eds. *Handbook of STS*, 3rd edition (Cambridge, MA: MIT Press, 2007), pp. 583-607.

C. Cohn, “Nuclear Language and How We Learned to Pat the Bomb,” *Bulletin of the Atomic Scientists* 43(5):17-24 (June 1987).

http://www.genderandsecurity.org/Cohn_Nuclear_Language.pdf

B. Wynne, "Misunderstood Misunderstandings: Social Identities and Public Uptake of Science," in A. Irwin and B. Wynne, eds., *Misunderstanding Science? The Public Reconstruction of Science and Technology* (Cambridge: Cambridge University Press, 1996), pp. 19-46.

Week 10: Guest speaker/group activity

Course expectations

In addition to submitting assessed material, students are expected to attend and participate in all classes. They are expected to have read the essential (and ideally recommended) reading before each class and be willing to discuss the literature and the lecture. Students are expected to conduct online research into areas of new technology. Students are also expected to share their work in progress, such that they can be read and commented upon by other members of the class. Those assessments reaching the required standard will have the opportunity to be included in the collective report, which will be shared more widely, outside UCL.

Important policy information

Details of college and departmental policies relating to modules and assessments can be found in the STS Student Handbook www.ucl.ac.uk/sts/handbook

All students taking modules in the STS department are expected to read these policies.
